SPEC® MPIM2007 Result

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Intel Corporation

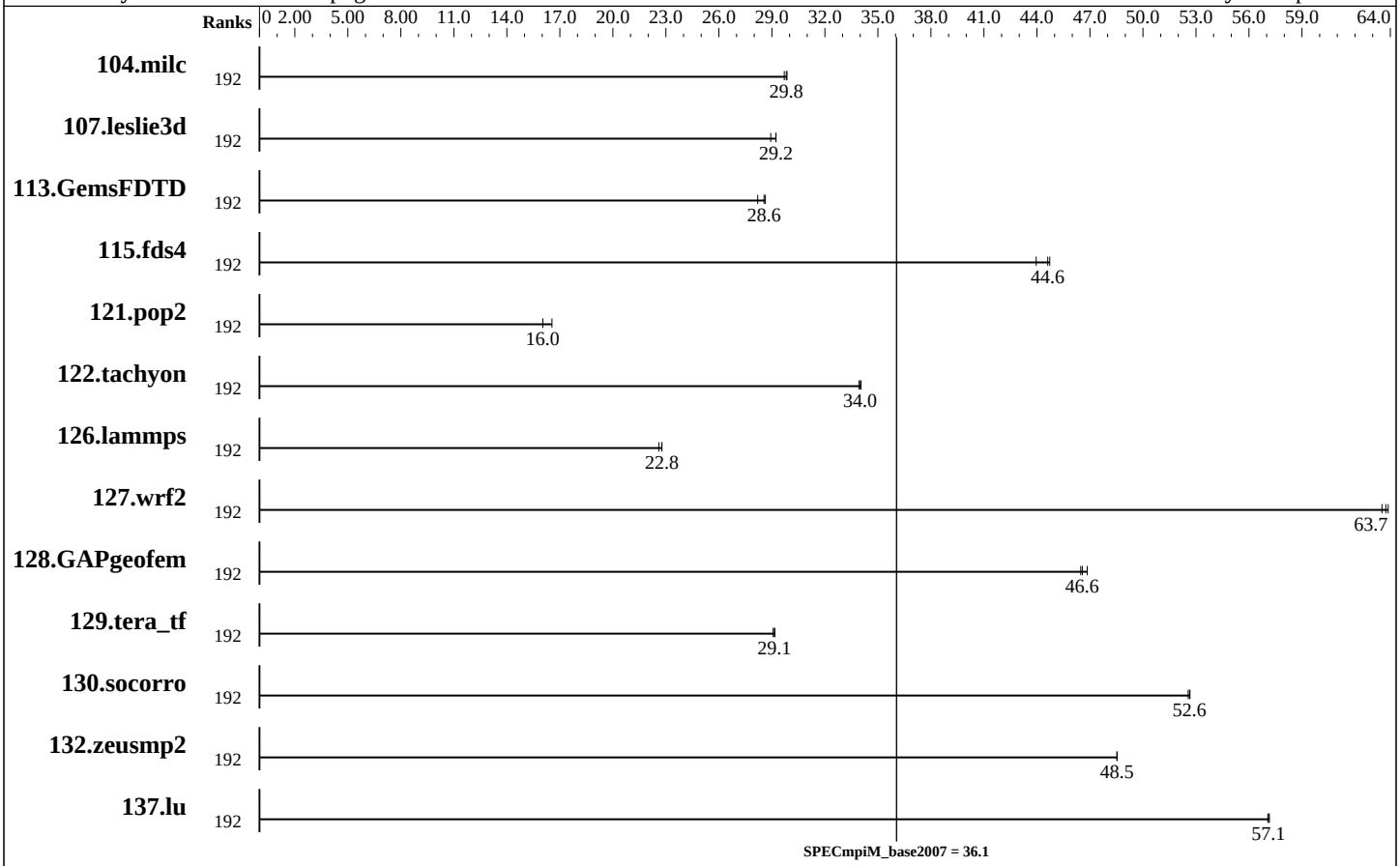
Endeavor (Intel Xeon E5-2697 v2, 2.70 GHz,
DDR3-1866 MHz, SMT on, Turbo off)

SPECmpiM_peak2007 = Not Run

SPECmpiM_base2007 = 36.1

MPI2007 license: 13
Test sponsor: Intel Corporation
Tested by: Pavel Shelepugin

Test date: Aug-2013
Hardware Availability: Sep-2013
Software Availability: Sep-2013



Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	192	52.7	29.7	**52.5**	**29.8**	52.4	29.9							
107.leslie3d	192	180	28.9	**179**	**29.2**	179	29.2							
113.GemsFDTD	192	224	28.2	**221**	**28.6**	220	28.6							
115.fds4	192	44.4	44.0	43.6	44.7	**43.7**	**44.6**							
121.pop2	192	257	16.0	**257**	**16.0**	249	16.6							
122.tachyon	192	**82.3**	**34.0**	82.2	34.0	82.5	33.9							
126.lammps	192	129	22.6	128	22.8	**128**	**22.8**							
127.wrf2	192	123	63.5	**122**	**63.7**	122	63.9							
128.GAPgeofem	192	44.1	46.8	**44.3**	**46.6**	44.4	46.5							
129.tera_tf	192	95.2	29.1	**95.0**	**29.1**	94.9	29.2							

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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Results Table (Continued)

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	192	72.6	52.6	72.5	52.7	**72.5**	**52.6**							
132.zeusmp2	192	63.9	48.5	63.9	48.5	**63.9**	**48.5**							
137.lu	192	64.4	57.1	**64.4**	**57.1**	64.3	57.2							

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Hardware Summary

Type of System:	Homogeneous
Compute Node:	Endeavor Node
Interconnects:	IB Switch Gigabit Ethernet
File Server Node:	NFS
Total Compute Nodes:	8
Total Chips:	16
Total Cores:	192
Total Threads:	384
Total Memory:	512 GB
Base Ranks Run:	192
Minimum Peak Ranks:	--
Maximum Peak Ranks:	--

Software Summary

C Compiler:	Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728
C++ Compiler:	Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728
Fortran Compiler:	Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728
Base Pointers:	64-bit
Peak Pointers:	64-bit
MPI Library:	Intel MPI Library 4.1.1.036 for Linux
Other MPI Info:	None
Pre-processors:	No
Other Software:	None

Node Description: Endeavor Node

Hardware

Number of nodes:	8
Uses of the node:	compute
Vendor:	Intel
Model:	R2208GZ4GC
CPU Name:	Intel Xeon E5-2697 v2
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	24
Cores per chip:	12
Threads per core:	2
CPU Characteristics:	Intel Turbo Boost Technology disabled, 8.0 GT/s QPI, Hyper-Threading enabled
CPU MHz:	2700
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	30 MB I+D on chip per chip, 30 MB shared / 12 cores
Other Cache:	None
Memory:	64 GB (8 x 8 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem:	Seagate 600 GB SSD ST9600205SS
Other Hardware:	None
Adapter:	Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
Number of Adapters:	1

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Software

Adapter:	Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller
Adapter Driver:	e1000
Adapter Firmware:	None
Adapter:	Mellanox MCX353A-FCAT ConnectX-3
Adapter Driver:	OFED 1.5.3.1
Adapter Firmware:	2.10.0
Operating System:	Red Hat EL 6.1, kernel 2.6.32-131
Local File System:	Linux/ext2
Shared File System:	NFS
System State:	Multi-User
Other Software:	Platform LSF 8.0

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MPI2007 license: 13
Test sponsor: Intel Corporation
Tested by: Pavel Shelepugin

Test date: Aug-2013
Hardware Availability: Sep-2013
Software Availability: Sep-2013

Node Description: Endeavor Node

Slot Type:	PCI-Express x8
Data Rate:	1Gbps Ethernet
Ports Used:	2
Interconnect Type:	Ethernet
Adapter:	Mellanox MCX353A-FCAT ConnectX-3
Number of Adapters:	1
Slot Type:	PCIe x8 Gen3
Data Rate:	InfiniBand 4x FDR
Ports Used:	1
Interconnect Type:	InfiniBand

Node Description: NFS

Hardware

Number of nodes:	1
Uses of the node:	fileserver
Vendor:	Intel
Model:	S7000FC4UR
CPU Name:	Intel Xeon CPU
CPU(s) orderable:	1-4 chips
Chips enabled:	4
Cores enabled:	16
Cores per chip:	4
Threads per core:	2
CPU Characteristics:	--
CPU MHz:	2926
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	8 MB I+D on chip per chip, 4 MB shared / 2 cores
L3 Cache:	None
Other Cache:	None
Memory:	64 GB
Disk Subsystem:	8 disks, 500GB/disk, 2.7TB total
Other Hardware:	None
Adapter:	Intel 82563GB Dual-Port Gigabit Ethernet Controller
Number of Adapters:	1
Slot Type:	PCI-Express x8
Data Rate:	1Gbps Ethernet
Ports Used:	1
Interconnect Type:	Ethernet

Software

Adapter:	Intel 82563GB Dual-Port Gigabit Ethernet Controller
Adapter Driver:	e1000e
Adapter Firmware:	N/A
Operating System:	RedHat EL 5 Update 4
Local File System:	None
Shared File System:	NFS
System State:	Multi-User
Other Software:	None

Interconnect Description: IB Switch

Hardware		Software
Vendor:	Mellanox	
Model:	Mellanox MSX6025F-1BFR	
Switch Model:	Mellanox MSX6025F-1BFR	
Number of Switches:	46	
Number of Ports:	36	
Data Rate:	InfiniBand 4x FDR	
Firmware:	7.2.0	
Topology:	Fat tree	
Primary Use:	MPI traffic	

Interconnect Description: Gigabit Ethernet

Hardware		Software
Vendor:	Force10 Networks	
Model:	Force10 S50, Force10 C300	
Switch Model:	Force10 S50, Force10 C300	
Number of Switches:	15	
Number of Ports:	48	
Data Rate:	1Gbps Ethernet, 10Gbps Ethernet	
Firmware:	8.2.1.0	
Topology:	Fat tree	
Primary Use:	Cluster File System	

Submit Notes

```
The config file option 'submit' was used.
```

General Notes

```
130.socorro (base): "nullify_ptrs" src.alt was used.

 MPI startup command:
   mpiexec.hydra command was used to start MPI jobs.

 BIOS settings:
   Intel Hyper-Threading Technology (SMT): Enabled (default is Enabled)
   Intel Turbo Boost Technology (Turbo)  : Disabled (default is Enabled)

 RAM configuration:
   Compute nodes have 2x8-GB RDIMM on each memory channel.

 Network:
   Forty six 36-port switches: 18 core switches and 28 leaf switches.
   Each leaf has one link to each core. Remaining 18 ports on 25 of 28 leafs
   are used for compute nodes. On the remaining 3 leafs the ports are used
```

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General Notes (Continued)

```
    for FS nodes and other peripherals.

  Job placement:
    Each MPI job was assigned to a topologically compact set of nodes, i.e.
    the minimal needed number of leaf switches was used for each job: 1 switch
    for 24/48/96/192/384 ranks, 2 switches for 768 ranks, 4 switches for 1536 ranks,
    8 switches for 3072 ranks.

  Platform LSF was used for job submission. It has no impact on performance.
    Information can be found at: http://www.platform.com
```

Base Compiler Invocation

C benchmarks:
`mpiicc`

C++ benchmarks:

126.lammps: `mpiicpc`

Fortran benchmarks:
`mpiifort`

Benchmarks using both Fortran and C:
`mpiicc mpiifort`

Base Portability Flags

121.pop2: `-DSPEC_MPI_CASE_FLAG`
126.lammps: `-DMPICH_IGNORE_CXX_SEEK`
127.wrf2: `-DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX`
130.socorro: `-assume nostd_intent_in`

Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX-I -no-prec-div`

C++ benchmarks:

126.lammps: `-O3 -xCORE-AVX-I -no-prec-div`

Fortran benchmarks:
`-O3 -xCORE-AVX-I -no-prec-div`

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-O3 -xCORE-AVX-I -no-prec-div`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.xml`

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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